

Carolina's share of gross domestic product (GDP). Three of the top forty American academic research institutions in total R&D support—Duke University (26th), the University of North Carolina at Chapel Hill (UNC-CH, 28th), and North Carolina State University (NCSU, 36th)—are located in North Carolina. Those three institutions account for 88 percent of the state's total, though other institutions have prominent R&D support in particular disciplines or technology fields.

The rate of growth of total funding for academic R&D activity has significantly outpaced the nation and a set of comparison states (California, Georgia, Massachusetts, Michigan, Texas, and Virginia). From 1985 to 1994, constant dollar funding for academic R&D grew by 94 percent, compared to 63 percent for the nation, and 60 percent for the composite group of comparable states. Among the three largest institutions, R&D expenditures at Duke grew by nearly 140 percent over the period, at UNC-CH by nearly 100 percent, and at NCSU by nearly 50 percent. Among mid-sized institutions, expenditures at Wake Forest, North Carolina A&T, and East Carolina University at least doubled in real terms. Expenditures at UNC-Greensboro, which started from a small base, grew by over 186 percent.⁵

While the overall level of funding for R&D in North Carolina's academic institutions grew significantly between 1985 and 1994, the sources of funding shifted to a modest degree. Federal R&D support remained at about the same proportion—slightly more than 60 percent—while industry support increased from 6.6 percent to 9.8 percent. During that time state and local government support as a share decreased (from 18.8 to 13.6 percent) while institutional support (including foundations) increased from 8.2 to 9.5 percent. Compared to the nation and the group of comparable states, North Carolina currently has about the same share of federal support, a significantly larger relative share of support from industry and state and local government, and a significantly smaller share of institutional support.

The shifts in the distribution of funding by institution are more dramatic. Industry-funded R&D at Duke and UNC-CH grew by over 260 and 400 percent in real terms, respectively, between 1985 and 1994. At Wake Forest, industry R&D support grew by over 2000 percent. Federal R&D growth significantly exceeded the national average for all North Carolina institutions for which data are available, except North Carolina Central University (NCCU). The latter's federal R&D expenditures grew by 20 percent, compared to the national average 56 percent. Overall, NCCU's R&D expenditures fell by 25 percent in real terms over the 1985-1994 period.

Other measures of R&D performance are innovativeness (patents filed and issued, licenses, royalties, invention disclosures and startups) and enrollments in science and engineering programs. While basic research, along with teaching, are the two traditional functions of research universities, applied research that leads to product and process innovations in the marketplace has become an increasingly important activity for both public and private universities. In fact, by most measures of innovativeness, North Carolina's share of the national total increased from 1991 to 1995. Indeed, the state is second only to Massachusetts and ranks above California, Texas, Virginia, Georgia, and Michigan by most of the measures. Based on this information, we can conclude that North Carolina's academic institutions are becoming prominent players in tech-